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## (54) Title: LOW TEMPERATURE OXYGEN GAS SENSOR

## (57) Abstract


A highly sensitive oxygen gas sensor (60), which operates at ambient and sub–ambient temperatures was developed using nonstoichiometric metal oxides such as ferroelectric PZT materials or yttria stabilized zirconia. The sensor is constructed of a solid state electrolyte thin film (62) of the nonstoichiometric metal oxide material sandwiched between two metal electrodes (64, 68). An offset d.c. voltage, which is manifested as a translation of the ferroelectric hysteresis loop, develops between the two electrodes (64, 68) when an electric field is applied. The magnitude and direction of the offset voltage depends on variations in oxygen concentration or partial pressure at one of the device electrodes.